IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of
BERNARDUS HENDRIKUS WILHELMUS HENDRIKS ET AL.

Atty. Docket NL 030468

Confirmation No. 6577
Serial No. 10/556,246 Group Art Unit: 2872

Filed: NOVEMBER 10, 2005 Examiner: MCNAULL, A. D.

Title: ADJUSTABLE MIRROR

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APPEAL BRIEF

Sir:

Appellants herewith respectfully present a Brief on Appeal as follows, having filed a Notice of Appeal on July 20, 2007:

REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of record Koninklijke Philips Electronics N.V., a corporation of The Netherlands having an office and a place of business at Groenewoudseweg 1, Eindhoven, Netherlands 5621 BA.

RELATED APPEALS AND INTERFERENCES

Appellants and the undersigned attorney are not aware of any other appeals or interferences which will directly affect or be directly affected by or having a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-20 are pending in this application. Claims 1-10, 12-15, 17 and 19 are rejected in the Final Office Action mailed April 23, 2007, where claims 11, 16, 18 and 20 are indicated as allowable if rewritten in independent form. This rejection was upheld, in an Advisory Action that mailed June 18, 2007. Claims 1-10, 12-15, 17 and 19 are the subject of this appeal.

STATUS OF AMENDMENTS

Appellants filed on June 1, 2007 an after final amendment in response to a Final Office Action dated April 23, 2007. The after final amendment includes amendments to the allowable claims 11, 16, 18 and 20, namely, re-writing them in independent form without including all features of the base claims. In an Advisory Action mailed on June 18, 2007, it is indicated that the after final amendment filed on June 1, 2007 is not entered. This Appeal Brief is in response to the Final Office Action mailed April 23, 2007, that finally rejected claims 1-10, 12-15, 17 and 19, which remain finally rejected in the Advisory Action mailed on June 18, 2007.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention, for example, as recited in independent claims 1, 5 and 9-10, is directed to an optical device, such as an adjustable mirror, and methods of manufacturing and operating thereof. As described on page 4, lines 13-28; and page 4, lines 29-34 of the specification, and shown in FIG 2A, one embodiment includes an adjustable mirror 100 comprising a first fluid 130 and a second fluid 140 in contact over a meniscus 150 extending transverse to an optical axis 90. The fluids 130, 140 are substantially immiscible and having different indices of refraction. A reflective surface 110 extends transverse the optical axis 90.

A meniscus adjuster is provided, such as a voltage source 240 shown in FIG 3 and described on page 6, lines 30-34, or a pump 310 shown in FIG 4A and described on page 7, lines 20-31 of the specification. The meniscus adjuster 240, 310 is arranged to controllably alter the shape (as shown in FIG 2A) or the position (as shown in FIG 4A) of the meniscus 150. In another embodiment shown in FIG 7 and described on page 10, lines 4-25, the meniscus

adjuster 240, 310 is arranged to controllably alter the shape or the position of a meniscus 154 so that the meniscus 154 is asymmetric with respect to the optical axis 90.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claim 5 of U.S. Patent Application Serial No. 10/556,246 complies with the written description requirement under 35 U.S.C. §112, second paragraph;

Whether claims 1-6, 9-10, 12-15, 17 and 19 of U.S. Patent Application Serial No. 10/556,246 are unpatentable under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 4,583,824 (Lea) in view of U.S. Patent No. 4,226,507 (Fuschetto); and

Whether claims 1, 5 and 7-8 of U.S. Patent Application Serial No. 10/556,246 are unpatentable under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. No. 5,825,801 (Nishida) in view of U.S. Patent No. 7,016,560 (Ticknor) and Fuschetto.

Appellants respectfully request the Board to address the patentability of independent claims 1, 5 and 9-10, and further claims 2-4, 6-8, 12-15, 17 and 19 as depending from independent claims 1, 5 and 9-10, based on the requirements of independent claims 1, 5 and 9-10. This position is provided for the specific and stated purpose of simplifying the current issues on appeal.

However, Appellants herein specifically reserve the right to argue and address the patentability of claims 2-4, 6-8, 12-15, 17 and 19 at a later date should the separately patentable subject matter of claims 2-4, 6-8, 12-15, 17 and 19 later become an issue. Accordingly, this limitation of the subject matter presented for appeal herein, specifically limited to discussions of the patentability of independent claims 1, 5 and 9-10 is not intended as a waiver of Appellants' right to argue the patentability of the further claims and claim elements at that later time.

ARGUMENT

Claim 5 is said to fail to comply with 35 U.S.C. §112, second paragraph.

Appellants respectfully traverse the rejection of claim 5 under 35 U.S.C. §112, second paragraph as allegedly indefinite for failing to point out and distinctly claim the subject matter.

The Final Office Action states on page 3, paragraph 2, "[t]he claim [5] describes an optical device comprising a reflector located at one of the optical device. This would imply that there is more than one optical device." It is respectfully submitted that the Final Office Actions misquotes claim 5 because claim 5 does not include the phrase "reflector located at one of the optical device" or the even the term "reflector". Accordingly, this rejection of claim 5 should be reversed.

Claims 1-6, 9-10, 12-15, 17 and 19 are said to be unpatentable over Lea and Fuschetto.

Lea is directed to an electrocapillary device that includes two immiscible fluids 31, 33. As clearly shown in the various

figures of Lea, such as FIG 2, all meniscuses of Lea are uniform and symmetric.

Fuschetto is cited in an attempt to remedy the deficiencies in Lea. Fuschetto is directed to a deformable mirror 11 attached to an actuator assembly having three piezo stacks 13, 15, 17 as shown in FIG 4. The Fuschetto deformable mirror 11 is not formed from any fluids. Rather, the Fuschetto deformable mirror 11 is formed from a flexible solid substance, and not from any fluids.

It is respectfully submitted that, at best, the combination of Lea and Fuschetto teaches two immiscible fluids with uniform and symmetric meniscuses plus a solid-phase deformable mirror.

Claims 1, 5 and 7-8 are said to be unpatentable over Nishida, Ticknor and Fuschetto.

Nishida is directed to a laser apparatus where a curvature of a reflection mirror is changeable by changing the pressure of a fluid. As correctly noted by the Examiner, Nishida does not teach or suggest a second fluid. Ticknor is cited in an attempt to remedy the deficiencies in Nishida.

Ticknor is directed to microfluidic control for waveguide optical switches having two immiscible fluids. As clearly shown in the various figures of Ticknor, such as FIG 3, all meniscuses of Ticknor are uniform and symmetric.

Fuschetto is cited in an attempt to remedy the deficiencies in Lea. As noted above, Fuschetto is directed to a deformable mirror 11 which is not formed from any fluids. Rather, the Fuschetto deformable mirror 11 is formed from a flexible solid substance, and not from any fluids.

It is respectfully submitted that, at best, the combination of Lea, Fuschetto, Nishida and Ticknor teaches two immiscible fluids with uniform and symmetric meniscuses plus a solid-phase deformable mirror.

There is simply no disclosure or suggestion in Lea, Fuschetto, Nishida, Ticknor, and combinations thereof of the present invention as recited in independent claim 1, and similarly recited in independent claims 5 and 9-10 which, amongst other patentable elements, requires (illustrative emphasis provided):

> a first fluid and a second fluid in contact over a meniscus extending transverse an optical axis, the

fluids being substantially immiscible and having different indices of refraction;

a reflective surface extending transverse the optical axis; and

a meniscus adjuster arranged to controllably alter at least one of the shape and the position of the meniscus so that the meniscus is asymmetric with respect the optical axis.

An asymmetric fluid meniscus is nowhere disclosed or suggested in Lea, Fuschetto, Nishida, Ticknor, and combinations thereof. Accordingly, it is respectfully submitted that independent claims 1, 5 and 9-10 are allowable, and allowance thereof is respectfully requested. In addition, it is respectfully submitted that claims 2-4, 6-8, 12-15, 17 and 19 should also be allowed at least based on their dependence from independent claims 1, 5 and 9-10.

In addition, Appellants deny any statement, position or averment of the Examiner that is not specifically addressed by the foregoing argument and response. Any rejections and/or points of argument not addressed would appear to be moot in view of the presented remarks. However, the Appellants reserve the right to submit further arguments in support of the above stated position, should that become necessary. No arguments are waived and none of the Examiner's statements are conceded.

CONCLUSION

Claim 5 fully complies with 35 U.S.C. §112, second paragraph, and claims 1-6, 9-10, 12-15, 17 and 19 are patentable over Lea, Fuschetto, Nishida and Ticknor.

Thus, the Examiner's rejections of claims 1-6, 9-10, 12-15, 17 and 19 should be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

1. An adjustable mirror comprising:

a first fluid and a second fluid in contact over a meniscus extending transverse an optical axis, the fluids being substantially immiscible and having different indices of refraction;

a reflective surface extending transverse the optical axis; and

a meniscus adjuster arranged to controllably alter at least one of the shape and the position of the meniscus so that the meniscus is asymmetric with respect the optical axis.

2. The adjustable mirror as claimed in claim 1, wherein said reflective surface is a substantially planar surface.

3. The adjustable mirror as claimed in claim 1, wherein said meniscus adjuster is arranged to utilize the electrowetting effect to alter the shape of the meniscus.

4. The adjustable mirror as claimed in claim 1, the mirror further comprising an aspherical lens element extending substantially transverse an optical axis.

5. An optical device comprising:

a first fluid and a second fluid in contact over a meniscus extending transverse an optical axis, the fluids being substantially immiscible and having different indices of refraction;

a reflective surface extending transverse the optical axis; and

a meniscus adjuster arranged to controllably alter at least one of the shape and the position of the meniscus so that the meniscus is asymmetric with respect the optical axis.

6. The optical device as claimed in claim 5, wherein the device is a lighting system for providing a directed beam of light, the device further comprising a light source arranged to emit

electromagnetic radiation.

7. The optical device as claimed in claim 5, wherein the optical device comprises a laser cavity, the cavity including a second mirror.

8. The optical device as claimed in claim 7, wherein said second mirror is also an adjustable mirror.

9. A method of manufacturing an adjustable mirror, the method comprising the acts of:

providing a first fluid and a second fluid in contact over a meniscus extending substantially transverse an optical axis, the fluids being substantially immiscible and having different indices of refraction;

providing a reflective surface extending transverse the optical axis; and

providing a meniscus adjuster arranged to alter at least one of the shape and the position of the meniscus so that the meniscus

is asymmetric with respect the optical axis.

10. A method of operating an optical device, the optical device comprising:

a first fluid and a second fluid in contact over a meniscus extending transverse an optical axis, the fluids being substantially immiscible and having different indices of refraction; and

a reflective surface extending transverse the optical axis;

the method comprising controllably altering at least one of the shape and the position of the meniscus so that the meniscus is asymmetric with respect the optical axis.

11. The adjustable mirror of claim 1, wherein the meniscus adjuster is arranged to alter the at least one of the shape and the position of the meniscus by changing a first wettability of a first side wall of the adjustable mirror by a different amount than a second wettability of a second side wall of the adjustable mirror.

12. The adjustable mirror of claim 1, wherein a first contact angle between the meniscus and a first side wall of the adjustable mirror is different than a second contact angle between the meniscus and a second side wall of the adjustable mirror.

13. The adjustable mirror of claim 1, wherein the optical axis extends through a center of the adjustable mirror.

14. The adjustable mirror of claim 4, wherein the meniscus adjuster is arranged to alter the at least one of the shape and the position of the meniscus to form an effective mirror having a reflective part and a refractive part.

15. The optical device of claim 5, further comprising a reflector located at one of the optical device.

16. The optical device of claim 5, wherein the meniscus adjuster is arranged to alter the at least one of the shape and the position of the meniscus by changing a first wettability of a first

side wall of the adjustable mirror by a different amount than a second wettability of a second side wall of the adjustable mirror.

17. The optical device of claim 5, wherein a first contact angle between the meniscus and a first side wall of the adjustable mirror is different than a second contact angle between the meniscus and a second side wall of the adjustable mirror.

18. The method of claim 9, wherein the meniscus adjuster is arranged to alter the at least one of the shape and the position of the meniscus by changing a first wettability of a first side wall of the adjustable mirror by a different amount than a second wettability of a second side wall of the adjustable mirror.

19. The method of claim 9, wherein a first contact angle between the meniscus and a first side wall of the adjustable mirror is different than a second contact angle between the meniscus and a second side wall of the adjustable mirror.

20. The method of claim 10, wherein the meniscus adjuster is arranged to alter the at least one of the shape and the position of the meniscus by changing a first wettability of a first side wall of the adjustable mirror by a different amount than a second wettability of a second side wall of the adjustable mirror.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None